APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,929	03/04/2002	Toshiki Kubo	113197-024	6727

			EXAMINER
24573	7590	10/28/2003	MEYER, DAVID C

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ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2003* .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed July 21, 2003 have been fully considered but they are

not persuasive. The applicant traverses the rejection of claims 1 and 3 under 35 U.S.C.

102(b) in view of Tokumaru (US 5,611,015) on the following grounds:

- Tokumaru does not estimate the amount of angular disagreement of

  planes of polarization of optical fibers concretely

- Tokumaru does not disclose estimation of an amount of angular

  disagreement of planes of polarization of optical fibers based on the

  heights of two brightness peaks

The examiner maintains that Tokumaru does estimate the amount of angular

disagreement of planes of polarization of optical fibers. As stated in the prior Office

Action, a user estimates the amount of angular disagreement based on the values

generated by an image processing unit (pp. 2-3). These values are generated from sets

of *three* brightness peaks as opposed to sets of *only two* brightness peaks, but basing

estimation, as from the generated values, on three peaks includes basing such

estimation on *two* peaks.

The examiner acknowledges that Tokumaru discloses the use of peak position,

and not peak height, in generating the values used to estimate angular disagreement.

However, it is well known to use peak height in determining the alignment of a

polarization-maintaining optical fiber as taught by Yuhara (US 5,677,973). Hence, the

examiner makes the following new statement of rejection.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2.   Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokumaru (US 5,611,015) in view of Yuhara (US 5,677,973).

Regarding claim 1, Tokumaru et al discloses an apparatus for splicing polarization-maintaining optical fibers. The apparatus executes a method whereby the angular disagreement between the planes of polarization of two polarization-maintaining optical fibers 2,7 may be ascertained and corrected. In the operation of the apparatus, an LED 3 irradiates a lateral side of the optical fibers 1 and 2. Two patterns of luminance peaks are transmitted corresponding to the respective polarization planes of the two optical fibers. A camera 4 captures the patterns and sends a corresponding electrical signal to an image processing unit 5. The image processing unit calculates the positions of the luminance peaks and generates numerical values C and D to reflect them. A display 6 displays the luminance peaks for each fiber as well as the numerical values C and D. A user may manipulate dials 23,24 until the polarization planes of the two optical fibers are aligned, as evidenced when the values C and D are equal. The step of estimating the amount of angular disagreement between the planes of polarization of the two polarization-maintaining optical fibers is performed by a user, who bases her estimation on the values C and D as generated by the image processing unit. (See Figs. 1A, 1B, 2, 3, 4, and 7 as well as column 3, line 7 to column 5, line 11.)

Numerical values C and D are calculated based on positions of three brightness

peaks, which includes using two brightness peaks.

Tokumaru does not disclose that peak height is used in the calculation of values

C and D. However, it is well known to estimate an alignment angle of a polarization

maintaining optical fiber using peak height, as taught by Yuhara. In Yuhara, a light is

transversely radiated on an optical fiber and a CCD camera picks up an image of light

that has transmitted through the fiber. This image is used to generate an intensity

distribution from which the polarization angle of the fiber can be determined (column 9,

lines 10-57). The alignment of the optical fiber is ascertained based upon the heights of

peaks in the intensity distribution (Fig. 5B and column 9, lines 58-67). It would have

been obvious to one of ordinary skill in the art at the time of invention to incorporate

peak height into the determination of fiber polarization plane orientation because it is

well known to do so.

Regarding claim 2, Tokumaru et al does not disclose the steps of irradiating light

onto the fibers *after* they have been joined. However, the motivation for performing this

step is easily provided. Although a user would not be able to reorient the respective

polarization axes of the connected fibers following the connecting step, she would be

able to estimate the amount of angular disagreement between the two fibers' respective

polarization axes based, as before, on the numerical values C and D generated by the

image processing unit 5. This functionality is desirable and obvious from the standpoint

that it enables a user to evaluate whether a connecting step was performed

successfully. Based on the foregoing, it would have been obvious to one of ordinary skill

in the art at the time of invention to modify Tokumaru et al by irradiating light onto the

fibers after a connecting step in order to facilitate the evaluation of the connecting step's

success.

Regarding claim 3, Tokumaru et al discloses that after the values C and D are

set equal to each other (via manipulation of dials 23 and 24) "the polarization-

maintaining optical fibers 1 and 2 are fused, thereby splicing the optical fibers such that

their optical axes coincide." (See column 5, lines 8-11.)

3.   Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokumaru

in view of Yuhara as applied to claim 1, in further view of Feth.

Tokumaru et al does not disclose a method for connecting two optical fibers such

that the orientation angle between their respective polarization axes is a non-zero

predetermined angle. However, in some applications it is desirable to depolarize light

traveling within an optical fiber by means of a fiber section having a polarization axis

that is oriented at a non-zero angle with respect to the polarization axis of another fiber

section. Feth et al discloses a method for fabricating a depolarizer wherein first and

second optical fibers are oriented such that the angle between their respective

polarization axes is non-zero. (See Fig. 2, column 1, lines 14-35, and column 3, lines 6-

15.) It would have been obvious to one of ordinary skill in the art at the time of invention

to modify Tokumaru et al by using the apparatus to orient first and second optical fibers

such that the angle between their respective polarization axes is non-zero, in order

facilitate use in settings where controlled depolarization is desirable and necessary.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Meyer whose telephone number is 703-305-7955. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on 703-308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0935.

DCM
October 10, 2003

DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800